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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
10/792,244	03/03/2004	David R. Hembree	3592.10US (97-0321.10/US)	3976	
24247	7590 12/29/2005	•	EXAM	INER	
TRASK BRITT			MITCHELL, JAMES M		
P.O. BOX 2550 SALT LAKE CITY, UT 84110			ART UNIT	PAPER NUMBER	
SALI LAKE	C111, 01 64110		2813		
			DATE MAILED: 12/29/200	DATE MAILED: 12/29/2005	

Please find below and/or attached an Office communication concerning this application or proceeding.

1)⊠ Responsive to communication(s) filed on 05 October 2005. 2a)□ This action is FINAL. 2b)⊠ This action is non-final. 3)□ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213. Disposition of Claims 4)☑ Claim(s) 1-10 is/are pending in the application. 4a) Of the above claim(s) is/are withdrawn from consideration. 5)□ Claim(s) is/are allowed. 6)☑ Claim(s) is/are objected to. 7)□ Claim(s) is/are objected to. 8)□ Claim(s) is/are objected to. 9)□ The specification is objected to by the Examiner. 10)□ The drawing(s) filed on is/are: a)□ accepted or b)□ objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d). 11)□ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152. Priority under 35 U.S.C. § 119 12)□ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). a)□ All b)□ Some * ○□ None of: 1.□ Certified copies of the priority documents have been received application from the International Bureau (PCT Rule 17.2(a)). *See the attached detailed Office action for a list of the certified copies not received. Attachment(s) 11 ☑ Notice of Draftsperson's Patent Drawing Review (PTO-948) of Notice of International Discourse Statement(s) (PTO-1449 or PTO/5B/08) 5)□ Notice of Informal Patent Application (PTO-152)				AK
Examiner James M. Mitchell 2813 -The MAILING DATE of this communication appears on the cover sheet with the correspondence address – Pariod for Reply A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION. - Extension of time may be available under the provisions of 37 CFR 1.136(s). In no event, however, may a rayly be sinely feel with the correspondence address – Pariod for the mailing date of this communication. - Industry within the set or extended princip of the reply will, by statute, cause the application to become ABANCONED (35 U.S.C. § 113) ommunication. Pariod patent from adjustment. See 37 CFR 1.704(b). Status 1) □ Responsive to communication(s) filed on 0.5 October 2005. 2a) □ This action is FINAL. 2b) □ This action is non-final. 3) □ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11, 453 O.G. 213. Disposition of Claims 4) □ Claim(s) 1-10 is/are pending in the application. 4a) Of the above claim(s)		Application No.	Applicant(s)	
James M. Mitchell 2813		10/792,244	HEMBREE, DAVID R.	
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DETAILED ACTION

This office action is in response to the amendment filed October 5, 2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai et al. (U.S. 6,166,434) in combination with Block et al. (U.S. 5,137,959).

Desai (Fig 2A-F) discloses a semiconductor assembly comprising: a substrate (206) having a plurality of circuits (i.e. in contact with balls) on a portion of a surface thereof; a semiconductor die (203) having a plurality of bond pads located on an active surface thereof (i.e. portion in contact with balls) and having a back side surface; a plurality of solder balls (204) connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate; one of a glob top material and low viscosity polymeric (208; Col. 6, Lines 60-63) filling any space between the substrate and the semiconductor die; an thermal conductive adhesive (not shown; Col. 6, Lines 40-45) contacting at least a portion of the back side surface of the semiconductor die; and a heat sink cap (210; Col. 5, Lines 48-55) having portion thereof contacting a portion of the substrate covering the interface, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat

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sink cap having the edge portion (e.g., bottom of cap) substantially contacting the substrate ((Col. 6, Lines 47-51) and the heat sink contacting at least a portion the interface.

Desai does not appear to show that its thermal adhesive is a compliant, adhesive, gel elastomer, cross linked silicone, filled with thermally conductive material.

Block utilizes an interface that is a compliant, adhesive, gel elastomer, cross linked silicone, filled with thermally conductive material (Col. 1, Lines 55-65).

It would have been obvious to one of ordinary skill at the time the invention was made to form the adhesive of Desai with a compliant, adhesive, gel elastomer, cross linked silicone, filled with thermally conductive material in order to improve thermal conductivity as taught by Block (Col. 1, Lines 41-45)

Claims 2, 5, 7, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai (U.S 6,166,434) and Block et al. (U.S. 5,137,959) as applied to claims 1, 4, 6 and 9 and further in combination with Chia et al. (U.S. 6,225,695).

Neither Desai nor Block appears to shoe the heat-dissipating member with fins.

Chia teaches the use of fins (Fig 1A).

It would have been obvious to one of ordinary skill in the art to incorporate fins on the heat-dissipating member of Desai in order to order to provide greater surface area for cooling as taught by Chia (Col. 2, Lines 53-55).

Response to Arguments

Applicant's arguments with respect to the amended claims have been considered but are most in view of the new ground(s) of rejection.

In order to expedite prosecution, examiner has addressed limitations that may be relevant. Applicant contends that the prior art's cap does not touch the substrate and cites to a portion of the prior art's specification that indicates there is a gap for the underfill *in the process of placing the cap on the chip*; it does not preclude no portion of the cap is contact with the substrate Examiner is unpersuaded, because the prior art explicitly discloses that a portion of its cap (214, 216) is in contact with its substrate as indicated in the office action.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art discloses generally a heat dissipating member in contact with both the back surface of the chip through a thermal interface and a portion of the member in contact with the substrate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jmm

December/1/6/20

CARL WHITEHEAD, JR.

SUPERVISORY PATENT EXAMINER TECHNOLOGY CENTER 2800